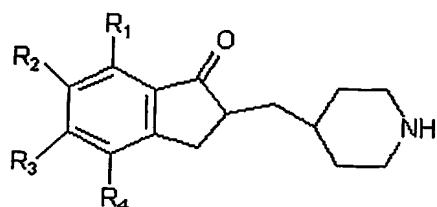


We claim:

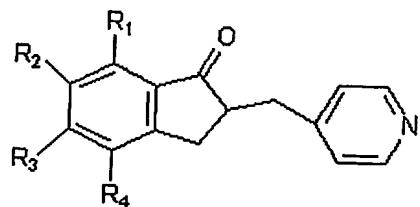
- 1 1. A process for the preparation of 2-(4-piperidinyl) methyl-1-indanone of formula II, or a
2 salt thereof,



3 **Formula II**

4 5 wherein R¹, R², R³, and R⁴ are identical or different, and represent hydrogen, straight or
6 branched -chain alkyl, alkoxy, alkoxy carbonyl, alkyl- or dialkyl-aminocarbonyloxy,
7 trifluoromethyl, or halogen,

8 8 the process comprising reducing 2-(4-pyridyl) methyl-1-indanone of formula III, or a salt
9 thereof,



10 **Formula III**

11 12 wherein R¹, R², R³, and R⁴ are as defined above; and recovering the 2-(4-piperidinyl) methyl-
13 1-indanone of formula II.

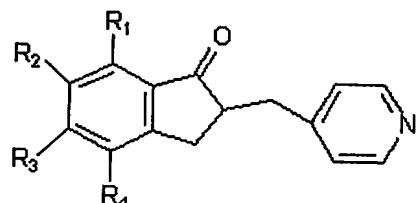
1 14 2. The process of claim 1, wherein R¹ and R⁴ represent hydrogen and R² and R³ represent
2 methoxy in formula II and formula III.

1 15 3. The process of claim 1, wherein the reduction comprises hydrogenation in the presence
2 of a catalyst.

- 1 4. The process of claim 3, wherein the catalyst comprises one or more of platinum oxide,
2 ruthenium oxide, and rhodium/carbon.
- 1 5. The process of claim 3, wherein the hydrogenation is carried out at a pressure of from
2 about 1 to about 2 atmospheres using hydrogen gas.
- 1 6. The process of claim 3, wherein the hydrogenation is carried out at a temperature of
2 from about 10°C to about 35°C.
- 1 7. The process of claim 3, wherein the hydrogenation is carried out in a solvent.
- 1 8. The process of claim 7, wherein the solvent comprises one or more of ethers, alcohols,
2 chlorinated hydrocarbons, esters, ketones, hydrocarbons, polar aprotic solvents, water and
3 mixtures thereof.
- 1 9. The process of claim 8, wherein the alcohol comprises one or more of methanol,
2 ethanol, propanol, isopropanol and butanol.
- 1 10. The process of claim 8, wherein the ether comprises one or more of dibutyl ether,
2 methyl tert-butyl ether, dioxane and tetrahydrofuran.
- 1 11. The process of claim 8, wherein the chlorinated hydrocarbon comprises one or more of
2 dichloromethane, tetrachloromethane and dichloroethylene.
- 1 12. The process of claim 8, wherein the ester comprises one or more of ethyl acetate and
2 isopropyl acetate.
- 1 13. The process of claim 8, wherein the ketone comprises one or more of acetone and
2 methylisobutylketone.
- 1 14. The process of claim 8, wherein the hydrocarbon comprises one or more of hexane,
2 toluene, and xylene.
- 1 15. The process of claim 8, wherein the polar aprotic solvent comprises one or more of
2 dimethylformamide, dimethyl sulphoxide, and N-methylpyrrolidone.

1 16. The process of claim 1, wherein the recovering comprises one or more of distillation,
 2 distillation under vacuum, filtration, filtration under vacuum, decantation, and centrifugation.

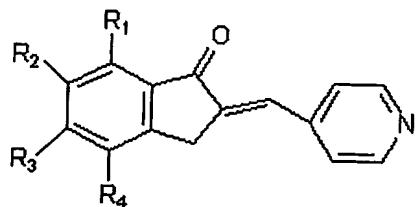
1 17. A process for the preparation of 2-(4-pyridyl) methyl-1-indanone of formula III, or a
 2 salt thereof,



4 **Formula III**

5 wherein R¹, R², R³, and R⁴ are identical or different, and represent hydrogen, straight or
 6 branched -chain alkyl, alkoxy, alkoxy carbonyl, alkyl- or dialkyl-aminocarbonyloxy,
 7 trifluoromethyl, or halogen,

8 the process comprising selectively reducing 2-(4-pyridyl) methylene-1-indanone of formula
 9 IV, or a salt thereof,



11 **Formula IV**

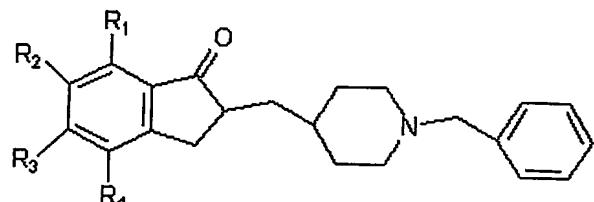
12 wherein R¹, R², R³, and R⁴ are as defined above; and recovering the 2-(4-pyridyl) methyl-1-
 13 indanone of formula III.

1 18. The process of claim 17, wherein R¹ and R⁴ represent hydrogen and R² and R³
 2 represent methoxy in formula III and formula IV.

- 1 19. The process of claim 17, wherein the reduction comprises hydrogenation in the presence
2 of a catalyst.
- 1 20. The process of claim 17, wherein the catalyst comprises one or more of
2 palladium/carbon, platinum/carbon and Raney nickel.
- 1 21. The process of claim 17, wherein the hydrogenation is carried out at a temperature of
2 from about 10°C to about 35°C.
- 1 22. The process of claim 17, wherein the hydrogenation is carried out in a solvent.
- 1 23. The process of claim 22, wherein the solvent comprises one or more of ethers, alcohols,
2 chlorinated hydrocarbons, esters, ketones, hydrocarbons, polar aprotic solvents, water, and
3 mixtures thereof.
- 1 24. The process of claim 22, wherein the alcohol comprises one or more of methanol,
2 ethanol, propanol, isopropanol and butanol.
- 1 25. The process of claim 22, wherein the chlorinated hydrocarbon comprises one or more of
2 dichloromethane, tetrachloromethane and dichloroethylene.
- 1 26. The process of claim 22, wherein the ether comprises one or more of dibutyl ether,
2 methyl tert-butyl ether, dioxane and tetrahydrofuran.
- 1 27. The process of claim 22, wherein the ester comprises one or more of ethyl acetate and
2 isopropyl acetate.
- 1 28. The process of claim 22, wherein the ketone comprises one or more of acetone and
2 methylisobutylketone.
- 1 29. The process of claim 22, wherein the hydrocarbon comprises one or more of hexane,
2 toluene, and xylene.
- 1 30. The process of claim 22, wherein the polar aprotic solvent comprises one or more of
2 dimethylformamide, dimethyl sulphoxide, and N-methylpyrrolidone.

1 31. The process of claim 17, wherein the recovering comprises one or more of distillation,
 2 distillation under vacuum, filtration, filtration under vacuum, decantation, and centrifugation.

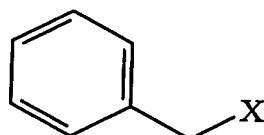
1 32. A process for the preparation of benzyl-piperidylmethyl-indanones of formula I, or a
 2 salt thereof,



4 **Formula I**

5 wherein R¹, R², R³, and R⁴ are identical or different, and represent hydrogen, straight or
 6 branched -chain alkyl, alkoxy, alkoxy carbonyl, alkyl- or dialkyl-aminocarbonyloxy,
 7 trifluoromethyl, or halogen,

8 the process comprising reacting 2-(4-piperidinyl) methyl-1-indanone of the formula II, or a
 9 salt thereof, prepared by the process of claim 1, with a benzyl derivative of formula V,



11 **Formula V**

12 wherein X is a leaving group; and recovering the benzyl-piperidylmethyl-indanones of
 13 formula I.

1 33. The process of claim 32, wherein the leaving group X in the benzyl derivative of
 2 formula V is chloride, bromide, iodide, tosylate, or sulphate.

1 34. The process of claim 32, wherein the reaction is carried out in the presence of a base
2 and a phase transfer catalyst.

1 35. The process of claim 34, wherein the base comprises one or more of an amine, an
2 inorganic base and ammonia.

1 36. The process of claim 35, wherein the inorganic base is an alkali metal carbonate.

1 37. The process of claim 36, wherein the alkali metal carbonate comprises one or more of
2 lithium carbonate, potassium carbonate and sodium carbonate.

1 38. The process of claim 34, wherein the phase transfer catalyst is comprises one or more
2 of quaternary ammonium salt, or quaternary phosphonium salt.

1 39. The process of claim 38, wherein the quaternary ammonium salt comprises one or
2 more of tetramethylammonium iodide, tetrabutylammonium iodide, teramethyl-2-
3 butylammonium chloride, trimethylcyclopropylammonium chloride, tetrabutylammonium
4 bromide, and t-butylethyldimethylammonium bromide.

1 40. The process of claim 32, wherein the reaction is carried out at a temperature of from
2 about 0°C to about 40°C.

1 41. The process of claim 32, wherein the reaction is carried out in a solvent.

1 42. The process of claim 41, wherein the solvent comprises one or more of ethers,
2 alcohols, chlorinated hydrocarbons, esters, ketones, hydrocarbons, polar aprotic solvents,
3 water and mixtures thereof

1 43. The process of claim 42, wherein the alcohol comprises one or more of methanol,
2 ethanol, propanol, isopropanol and butanol.

1 44. The process of claim 42, wherein the ether comprises one or more of dibutyl ether,
2 methyl tert-butyl ether, dioxane and tetrahydrofuran.

1 45. The process of claim 42, wherein the chlorinated hydrocarbon comprises one or
2 more of dichloromethane, tetrachloromethane and dichloroethylene.

1 46. The process of claim 42, wherein the ester comprises one or more of ethyl acetate
2 and isopropyl acetate.

1 47. The process of claim 42, wherein the ketone comprises one or more of acetone and
2 methylisobutylketone.

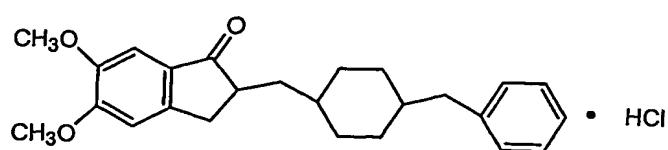
1 48. The process of claim 42, wherein the hydrocarbon comprises one or more of
2 hexane, toluene, and xylene.

1 49. The process of claim 42, wherein the polar aprotic solvent comprises one or more
2 of dimethylformamide, dimethyl sulphoxide, and N-methylpyrrolidone.

1 50. process of claim 32, wherein the recovering comprises one or more of distillation,
2 distillation under vacuum, filtration, filtration under vacuum, decantation, and
3 centrifugation.

1 51. A process e preparation of donepezil of formula VI or a pharmaceutically
2 acceptable salt thereof,

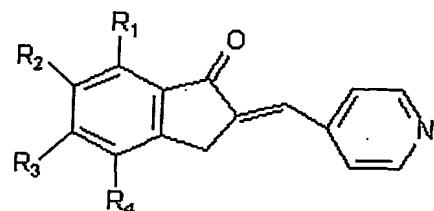
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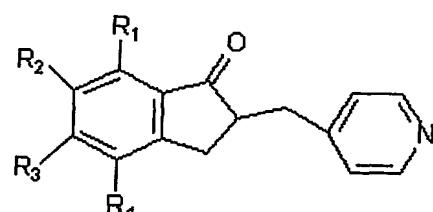
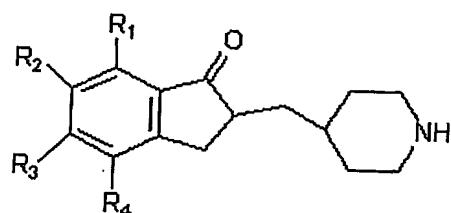
Formula VI

the process comprising:

(a) selectively reducing 2-(4-pyridyl) methylene-1-indanone of formula IV, or a salt thereof,

11 **Formula IV**

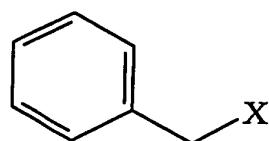
12 to obtain 2-(4-pyridyl) methyl-1-indanone of formula III,

14 **Formula III**15 wherein R¹ and R⁴ represent hydrogen and R² and R³ represent methoxy in formula III
16 and formula IV,17 (b) reducing the 2-(4-pyridyl) methyl-1-indanone of formula III to obtain 2-(4-
18 piperidinyl) methyl-1-indanone of formula II,20 **Formula II**21 wherein R¹ and R⁴ represent hydrogen and R² and R³ represent methoxy,

22 (c) reacting the 2-(4-piperidinyl) methyl-1-indanone of formula II,

23 with a benzyl derivative of formula V,

24



25

Formula V

26 wherein X is a leaving group, in the presence of an inorganic base and a phase transfer
27 catalyst, and

28 (d) recovering the donepezil or a pharmaceutically acceptable salt thereof.

1 52. the process of claim 51, wherein the leaving group X in the benzyl derivative of
2 formula V is chloride, bromide, iodide, tosylate, or sulphate.

1 53. pharmaceutical composition comprising a therapeutically effective amount of
2 donepezil or a pharmaceutically acceptable salt thereof obtained by the process of claim
3 51; and one or more pharmaceutically acceptable carriers, excipients or diluen.